



California Environmental Protection Agency

AIR RESOURCES BOARD

Introduction of PM2.5 Network Setup and Operating Costs Spreadsheet

GHA 05/08/98

Following is a general description of the spreadsheet and the function and use of each page.

This spreadsheet should only be used as an investigative tool that allows the user to set up and evaluate alternative sampling schemes. This spreadsheet can be used to compare the cost of setting up and deploying different monitoring, analysis, and laboratory options. Cost summaries are provided for all NEW samplers deployed the year in question and for ALL samplers in operation the year in question.

The user enters specific information on the Network Design and Adjustable Costs pages. The Speciation Sampler, FRM Filter Analysis, Field and Summary pages takes the information entered on the Network Design and Adjustable Costs pages and provides a detailed year by year cost breakdown. The Summary page gives a brief summary of the previous pages.

The following color codes apply to the following pages

- * Values in red may be changed by the user
- * Values in dark red are original values and are included for reference
- * Values in purple are directly linked to the Adjustable Costs Page (capital, operating costs...)
- * Values in blue are directly linked to the Network Design Page (# of samplers, speciation...)
- * Values in black are the results from user entries and calculations

* Titles highlighted in yellow indicate network design functions

* Titles highlighted in green indicate laboratory functions

* Titles highlighted in blue indicate ambient monitoring functions

Network Design - *user inputs*

- * Number of samplers for FRM/FEM, Continuous, Speciation networks
- * Sampling frequency
- * Site set up requirements, minimal or major
- * Percent of days network deployed for the year
- * Laboratory set up required?

* Percent of samples to analyzed for mass, elements, ions(Chromatography), carbon, ions (Colorimeter)

Adjustable Costs - *user inputs*

+ Field Costs

- ~ Site set up costs, minimal and major
- ~ Sampler cost
- ~ Sampler maintenance frequency
- ~ Sampler support equipment
- ~ Shipping
- ~ Flow or Temperature/Pressure Audit frequency
- ~ Sampler Calibration Frequency
- ~ Estimated time to perform maintenance, audits, calibration
- ~ Annual labor cost

+ Laboratory Costs

- ~ Analytical Instruments
- ~ Number of existing Analytical instruments
- ~ Annual analytical filter capacity per instrument
- ~ Laboratory specific furniture
- ~ Support equipment
- ~ Computer or Laboratory Information System Costs
- ~ Service contracts
- ~ Materials
- ~ Annual labor cost

FRM Filter Analysis - *no user inputs*

This page combines the values entered on the Network Design and Adjustable Costs pages and calculates the cost of performing analysis on samples collected from the FRM Sampler sampling network. The information is separated into startup and operating cost categories by analysis type. For the FRM/FEM network, mass, elements by x-ray and ions by chromatography are possible.

Speciation Sampler - *no user inputs*

This page combines the values entered on the Network Design and Adjustable Costs pages and calculates the cost of performing analysis on samples collected from the Speciation Sampler sampling network. The information is separated into startup and operating cost categories by analysis type. For the Speciation Sampler network, mass, elements by x-ray, ions by chromatography, total carbon, and ions by automated colorimeter are possible.

Field - *no user inputs*

This page combines the values entered on the Network Design and Adjustable Costs pages and calculates the cost of supporting and operating the FRM/FEM, Continuous, and Speciation sampler. The information is separated into equipment and support categories.

Summary - *no user inputs*

This page gives the summary capital and operating cost for field operations, FRM sampler laboratory costs and speciated sampler laboratory costs. In addition this page lists the number of samplers, the sampling frequency and potential number of sampling runs available.

Sampling and Speciation Frequency for FRM/FEM and Speciation Samplers

* Values in **red** may be changed by the user

* Variables on this page are linked to the following pages and displayed in **blue**

Agency Name
Estimate version

FRM & FEM NETWORK CONFIGURATION

	Year1	Year2	Year3	3 Year Total
Number of new samplers on daily schedule	9	1	0	10
-- at new sites or sites requiring major modifications	3	1	0	
-- at existing sites	6	0	0	
Number of new samplers on 1-in-3 schedule	17	0	0	17
-- at new sites or sites requiring major modifications	3	0	0	
-- at existing sites	14	0	0	
Number of new samplers on 1-in-6 schedule	0	0	0	0
-- at new sites or sites requiring major modifications	0	0	0	
-- at existing sites	0	0	0	
Number of new collocated samplers (1-in-6 sched.)	7	1	0	8
-- sequential samplers	7	1	0	
-- single filter samplers	0	0	0	
New samplers per year	33	2	0	
Total number of FRM/FEM samplers	33	35	35	35
Percent of available operating days for initial year of deployment, program assumes 100 % for following year(s)	32.75	100	100	
Number of available operating days	120	365	365	
Total Resulting Filter Samples				
-- Number of new Daily samples per year	1080	365	0	
-- Number of new 1-in-3 samples per year	680	0	0	
-- Number of new 1-in-6 samples per year	0	0	0	
-- Number of new Collocated samples per year	140	61	0	
	1900	426	0	
Total number of samples per year	1900	6228	6228	14356

Laboratory Analyses for FRM/FEM Samples

(Type 0 in the percent column if no analysis is to be performed)

Are Samples to be Analyzed by Outside Agency (y/n)? **n**

Laboratory set up required for mass (y/n)?	y	Number of filter samples		
-- percent of DAILY samples weighed	100	1080	365	0
-- percent of 1-in-3 samples weighed	100	680	0	0
-- percent of 1-in-6 samples weighed	100	0	0	0
-- percent of COLLOCATED samples weighed	100	140	61	0
		1900	426	0
Total number of samples per year		1900	6228	6228
				14356

Laboratory set up required Elements by X-Ray (y/n)? **n**

-- percent of DAILY samples by X-Ray	0	0	0	0
-- percent of 1-in-3 samples by X-Ray	0	0	0	0
-- percent of 1-in-6 samples by X-Ray	0	0	0	0
-- percent of COLLOCATED samples by X-Ray	0	0	0	0
		0	0	0
Total number of samples per year		0	0	0

Laboratory set up required Ion Chromatography (y/n) **n**

-- percent of DAILY samples by Chromatography	0	0	0	0
-- percent of 1-in-3 samples by Chromatography	0	0	0	0
-- percent of 1-in-6 samples by Chromatography	0	0	0	0
-- percent of COLLOCATED samples by Chromatography	0	0	0	0
		0	0	0
Total number of samples per year		0	0	0

CONTINUOUS SAMPLERS NETWORK CONFIGURATION

	Year1	Year2	Year3	3 Year Total
Number of Continuous Samplers (Real time data)				
-- at new sites or sites requiring major modifications	0	0	0	0
-- at existing sites	0	0	0	0
New number of continuous samplers	0	0	0	
Total number of continuous samplers	0	0	0	0
Percent of days sampler in operation	100	100	100	
Number of annual operating days	365	365	365	

SPECIATION SAMPLER NETWORK CONFIGURATION					Year1	Year2	Year3	3 Year Total
Number of new samplers on 1-in-6 schedule					0	0	0	0
-- at new sites or sites requiring major modifications					0	0	0	
-- at existing sites					0	0	0	
Number of new samplers on 1-in-12 schedule					0	0	0	0
-- at new sites or sites requiring major modifications					0	0	0	
-- at existing sites					0	0	0	
Number of new samplers on USER SELECTED schedule					0	0	0	0
-- Enter sampling frequency. (1 = everyday, 3 = every 3 days)					1	1	1	
-- number of sampling days from User selected schedule					365	365	365	
-- at new sites or sites requiring major modifications					0	0	0	
-- at existing sites					0	0	0	
New speciation samplers per year					0	0	0	
Total number of speciation samplers					0	0	0	0
Percent of days sampler in operation					100	100	100	
Number of annual operating days					365	365	365	
Total Resulting Filter Sample Sets for Speciation								
-- number of new 1-in-6 samples per year					0	0	0	
-- number of new 1-in-12 samples per year					0	0	0	
-- number of new User Selected samples per year					0	0	0	
New speciation filter samples per year					0	0	0	
Total number of speciation sample sets per year					0	0	0	0
Laboratory Analyses for Speciation Sampler					Year1	Year2	Year3	3 Year Total
(Type 0 in the percent column if no analysis is to be performed)								
Are Samples to be Analyzed by Outside Agency (y/n)?					n			
Set up Mass (y/n)					n			
-- percent of 1-in-6 samples weighed					0	0	0	
-- percent of 1-in-12 samples weighed					0	0	0	
-- percent of User Defined samples weighed					0	0	0	
Total number of samples per year					0	0	0	0
Set up Elements by X-Ray (y/n)					n			
-- percent of 1-in-6 samples weighed					100	0	0	0
-- percent of 1-in-12 samples weighed					100	0	0	0
-- percent of User Defined samples weighed					100	0	0	0
Total number of samples per year					0	0	0	0
Set up Ion Chromatography (y/n)					n			
-- percent of 1-in-6 samples weighed					100	0	0	0
-- percent of 1-in-12 samples weighed					100	0	0	0
-- percent of User Defined samples weighed					100	0	0	0
Total number of samples per year					0	0	0	0
Set up Total Carbon (y/n)					n			
-- percent of 1-in-6 samples weighed					100	0	0	0
-- percent of 1-in-12 samples weighed					100	0	0	0
-- percent of User Defined samples weighed					100	0	0	0
Total number of samples per year					0	0	0	0
Set up Ion by Automated Colorimeter (y/n)					n			
-- percent of 1-in-6 samples weighed					100	0	0	0
-- percent of 1-in-12 samples weighed					100	0	0	0
-- percent of User Defined samples weighed					100	0	0	0
Total number of samples per year					0	0	0	0

Capital, Operating and Labor Costs

Values in **red** may be changed by the user

Dark red are original values

Variables on this page are linked to the following pages and displayed in **purple**

Agency Name

Estimate version

FIELD COSTS

Field Capital Cost	Unit Cost				Original
-- Set up, new site or sites requiring major modifications (\$)	\$3				\$3
-- Set up, existing site (\$)	\$250				\$250
FRM/FEM Sampler	Units per year				
-- Sampler cost (\$) - Sequential	\$11				\$11
-- Sampler cost (\$) - Single	\$8				\$8
Spare parts - Sequential (10%)	\$1				\$1
Spare parts - Single (10%)	\$800				\$800
Number of flow calibrators		4	0	0	
-- Samplers per flow calibrator	10				10
-- Flow calibration equipment cost	\$1				\$1
Number of temp./press. calibrators		4	0	0	
-- Samplers per pressure, temperature calibrator	10				10
-- Pressure, temperature calibration equipment cost	\$1				\$1
Number of flow audit devices		4	0	0	
-- Samplers per flow audit device	10				10
-- Flow audit devices cost	\$1				\$1
Number of pressure, temperature audit devices		4	0	0	
-- Samplers per pressure, temperature set	10				10
-- Pressure, temperature audit devices cost	\$0				\$0
Continuous Sampler	Units per year				
-- Sampler cost (\$) - Continuous (e.g. TEOM, BAM)	\$17				\$17
Spare parts - Continuous (10%)	\$1				\$1
Number of flow calibrators		0	0	0	
-- Samplers per flow calibration	10				10
-- Flow calibration equipment cost	\$2				\$2
Number of other calibrators		0	0	0	
-- Samplers per other calibration	10				10
-- Other Calibration equipment cost	\$0				\$0
Number of flow audit devices		0	0	0	
-- Samplers per flow audit device	10				10
-- Flow audit device cost	\$2				\$2
Number of other audit devices		0	0	0	
-- Samplers per other audit device	10				10
-- Other audit device cost	\$0				\$0
Speciation Sampler	Units per year				
-- Sampler cost (\$) - Speciation (multi-channel sampler)	\$26				\$26
Spare parts - Speciation (10%)	\$2				\$2
Number of flow calibration devices		0	0	0	
-- Samplers per flow calibration set	10				10
-- Flow calibration equipment cost	\$6				\$6
Number of other calibration devices		0	0	0	
-- Samplers per other calibration set	10				10
-- Other calibration equipment cost	\$0				\$0
Number of audit devices		0	0	0	
-- Samplers per audit device	10				10
-- Flow audit devices cost	\$6				\$6
Number of other audit devices		0	0	0	
-- Samplers per other audit device	10				10
-- Other audit device cost	\$0				\$0

FIELD OPERATING				
FRM/FEM Sampler				
Electrical for FRM/FEM samplers (24 hours)	\$0.43			\$0.43
-- Cost per thousand watt hour	\$0.09			\$0.09
-- Power consumption watts	200			200
Field staff cost per filter (Includes WINS cleaning)	\$22			\$22
-- Number of runs between WINS service	5			5
-- Staff hours to service WINS	0.25			0.25
-- Field staff hours per filter (download & setup)	0.50			0.50
Field staff cost per filter, for other FRM/FEM services	\$11			\$11
-- Number of runs between other FRM/FEM services	15			15
-- Staff hours for other sampler service (flow checks, cleaning ...)	4.00			4.00
-- Shipping cost per filter (next day, ~1lbs)	\$5.00			\$5.00
Annual staff cost for flow calibration(s) per sampler	\$80			\$80
-- Annual frequency of multipoint flow calibrations	1			1
-- Staff Hrs. per multipoint flow calibration	2.0			2.0
Annual staff cost temperature/pressure calibration(s)	\$80			\$80
-- Annual frequency of temp./press. multipoint calibrations	1			1
-- Staff Hrs. per temp./press. calibration	2.0			2.0
Annual audit staff cost for flow audit	\$483			\$483
-- Annual frequency of flow audits	4			4
-- Staff Hrs. per flow audit	3.0			3.0
Annual audit staff cost for other audit	\$121			\$121
-- Annual frequency of other audits	1			1
-- Staff Hrs. per other audit	3.0			3.0
Field staff cost per hour	\$40			\$40
-- Annual field staff cost (including overhead and benefits)	\$85			\$85
Audit staff cost per hour	\$40			\$40
-- Annual audit and calibration staff cost (inclgd ovrhd & bnfts)	\$85			\$85
Continuous Sampler				
Electrical for continuous samplers (24 hours)	\$1.65			\$1.65
-- Cost per thousand watt hour	\$0.09			\$0.09
-- Power consumption watts	765			765
Annual field staff cost maintenance (filter, head cleaning)	\$979			\$979
-- Number of runs between maintenance	15			15
-- Staff Hrs. per maintenance (filter, head cleaning)	1.0			1.0
Staff cost multipoint flow calibration(s)	\$161			\$161
-- Annual frequency of multipoint flow calibration(s)	2			2
-- Staff Hrs. per multipoint flow calibration	2.0			2.0
Staff cost for other calibration(s)	\$80			\$80
-- Annual frequency of other calibration(s)	1			1
-- Staff Hrs. per other calibration	2.0			2.0
Audit staff cost for flow audit(s)	\$40			\$40
-- Annual frequency of flow audits	1			1
-- Staff Hrs. per flow audit	1.0			1.0
Audit staff cost for other audit(s)	\$0			\$0
-- Annual frequency of other audits	0			0
-- Staff Hrs. per other audit	1.0			1.0
Field staff cost per hour	\$40			\$40
-- Annual field staff cost (including overhead and benefits)	\$85			\$85
Audit staff cost per hour	\$40			\$40
-- Annual audit and calibration staff cost (inclgd ovrhd & bnfts)	\$85			\$85

Speciation Sampler

Electrical for continuous samplers (24 hours)	\$1.65				\$1.65
-- Cost per thousand watt hour	\$0.09				\$0.09
-- Power consumption	765				765
Field staff cost per filter set	\$80				\$80
-- Field staff hours per filter set	2.0				2.0
-- Shipping cost per filter set	\$5.00				\$5.00
Staff cost for flow calibration(s)	\$241				\$241
-- Annual frequency of flow calibration	2				2
-- Staff Hrs. per flow calibration	3.0				3.0
Staff cost maintenance check(s)	\$121				\$121
-- Annual frequency of maintenance check(s)	1				1
-- Staff Hrs. per maintenance (head cleaning, denuder servicing)	3.0				3.0
Annual audit staff cost for flow audit(s)	\$40				\$40
-- Annual frequency of flow audits	1				1
-- Staff Hrs. per flow audit	1.0				1.0
Annual audit staff cost for other audit(s)	\$0				\$0
-- Annual frequency of other audits	0				0
-- Staff Hrs. per other audit	1.0				1.0
Field staff cost per hour	\$40				\$40
-- Annual field staff cost (including overhead and benefits)	\$85				\$85
Audit staff cost per hour	\$40				\$40
-- Annual audit and calibration staff cost (inclgd ovrhd & bnfts)	\$85				\$85

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LABORATORY COSTS**MASS****One Time Laboratory Start Up Cost**

	Cost	Units per year			Cost
-- Furniture	\$13				\$13
-- Environmental control system	\$10				\$10
Additional balances for FRM/FEM sampler		1	0	0	
Additional balances for Speciation sampler		0	0	0	
Number of filters per Balance (annual)	15600				15600
-- Filters per week	300				300
-- Current number of microbalances available	0				0
-- Microbalance	\$9				\$9
-- Balance table	\$515				\$515
-- Temperature/Humidity recorder	\$600				\$600
-- Calibration materials	\$500				\$500
-- Computer/Printer	\$2				\$2
-- Large capacity refrigerator	\$5				\$5
-- Barcode reader	\$800				\$800
-- Data handling system (LIMS/LAN)	\$20				\$20

Annual Laboratory Operating Cost**Laboratory Support Cost**

-- Balance calibrations	\$100				\$100
-- Consumables for the balance room	\$500				\$500
-- LIMS service contract	\$1				\$1
-- LIMS/LAN support services	\$25				\$25

Analyses Cost

-- Materials, shipping (not including filter)	\$7				\$7
Staff cost (inspection, weighing, data submittal)	\$42.50				\$42.50
-- Staff hours per sample	1				1
Staff hourly cost	\$42.50				\$42.50
-- Annual staff cost (including overhead and benefits)	\$89				\$89

ELEMENTS BY X-RAY FLUORESCENCE

One Time Laboratory Start up Cost

Units per year

-- Furniture	\$3				\$3
Number of Spectrometers for FRM/FEM sampler		0	0	0	
Additional Spectrometers for Speciation sampler		0	0	0	
Number of filters per Spectrometer (annual)	4680				4680
-- Filters per week	90				90
-- Current number of Spectrometers available	0				0
-- XRF Spectrometer	\$161				\$161
-- Microscope	\$1				\$1
-- Computer/Printer	\$2				\$2
-- Data handling system (LIMS/LAN)	\$8				\$8

Annual Laboratory Operating Cost

Laboratory Support Cost

-- Service contract for spectrometer	\$8				\$8
-- LIMS service contract	\$850				\$850
-- LIMS/LAN support services	\$10				\$10

Analyses Cost

-- Materials	\$0.70				\$0.70
Staff cost (inspection, weighing, data submittal)	\$26.00				\$26.00
-- Staff hours per sample	0.5				0.5
Staff hourly cost	\$52.00				\$52.00
-- Annual staff cost (including overhead and benefits)	\$109				\$109

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IONS BY ION CHROMATOGRAPHY

One Time Laboratory Start up Cost

Units per year

-- Furniture	\$13				\$13
Number of Ion Chromatographs for FRM/FEM sampler		0	0	0	
Additional Chromatographs for Speciation sampler		0	0	0	
Number of filters per Chromatograph (annual)	4680				4680
-- Filters per week	90				90
-- Current number of Chromatographs available	0				0
-- Ion Chromatograph	\$70				\$70
-- NanoPure water system	\$2				\$2
-- Sonicator/Bath (for extractions)	\$1				\$1
-- Shaker (for extractions)	\$3				\$3
-- Barcode reader	\$800				\$800
-- Refrigerator	\$5				\$5
-- Freezer	\$5				\$5
-- Computer/Printer	\$2				\$2
-- Data handling system (LIMS/LAN)	\$8				\$8

Annual Laboratory Operating Cost

Laboratory Support Cost

-- LIMS service contract	\$9				\$9
-- LIMS/LAN service contract	\$430				\$430
-- LIMS/LAN Support Services	\$10				\$10

Analyses Cost

-- Materials	\$5.15				\$5.15
Staff cost (inspection, weighing, data submittal)	\$42.50				\$42.50
-- Staff hours per sample	1				1
Staff hourly cost	\$42.50				\$42.50
-- Annual staff cost (including overhead and benefits)	\$89				\$89

TOTAL CARBON

One Time Laboratory Start up Cost

Units per year

-- Furniture	\$3				\$3
Number of Carbon analyzers		0	0	0	
Number of filters per Carbon Analyzer (annual)	2080				2080
-- Filters per week	40				40
-- Current number of Carbon analyzers available	0				0
-- Carbon analyzer	\$26				\$26
-- Barcode reader	\$800				\$800
-- Computer/Printer	\$2				\$2
-- Data handling system (LIMS/LAN)	\$4				\$4

Annual Laboratory Operating Cost

Laboratory Support Cost

-- Service contract for carbon analyzer	\$0				\$0
-- LIMS service contract	\$200				\$200
-- LIMS/LAN support services	\$5				\$5

Analyses Cost

-- Materials	\$2.50				\$2.50
Staff cost (inspection, weighing, data submittal)	\$31.88				\$31.88
-- Staff hours per sample	0.75				0.75
Staff hourly cost	\$42.50				\$42.50
-- Annual staff cost (including overhead and benefits)	\$89				\$89

AUTOMATED COLORIMETER (Nitrate Ion)

One Time Laboratory Start up Cost

Units per year

-- Furniture	\$3				\$3
Number of Automated Colorimeters		0	0	0	
Number of filters per Colorimeter (annual)	8320				8320
-- Filters per week	160				160
-- Current number of Colorimeters available	0				0
-- Automated Colorimeter	\$30				\$30
-- Barcode reader	\$800				\$800
-- Computer/Printer	\$2				\$2
-- Data handling system (LIMS/LAN)	\$0				\$0

Annual Laboratory Operating Cost

Laboratory Support Cost

-- Service contract for Automated Colorimeter	\$2				\$2
-- LIMS service contract	\$850				\$850
-- LIMS/LAN support services	\$15				\$15

Analyses Cost

-- Materials	\$2.50				\$2.50
Staff cost (inspection, weighing, data submittal)	\$8.50				\$8.50
-- Staff hours per sample	0.2				0.2
Staff hourly cost	\$42.50				\$42.50
-- Annual staff cost (including overhead and benefits)	\$89				\$89

Start up and Annual Laboratory Cost for Analyses using FRM Sampler and Filter Media

Purple values are input on Adjustable Costs Page

Agency Name

Blue values are input on Network Design Page

Estimate version

MASS

One Time Laboratory Start Up Cost		Year 1	Year 2	Year 3	3 YearTotal
-- Furniture	\$13	\$13			
-- Environmental control system	\$10	\$10			
-- Microbalance	\$9	\$9	\$0	\$0	
-- Balance table	\$515	\$515	\$0	\$0	
-- Temperature/Humidity recorder	\$600	\$600			
-- Calibration materials	\$500	\$500			
-- Computer/Printer	\$2	\$2	\$0	\$0	
-- Large capacity refrigerator	\$5	\$5			
-- Barcode reader	\$800	\$800	\$0	\$0	
-- Data handling system (LIMS/LAN)	\$20	\$20			
Total capital start up cost		\$62	\$0	\$0	\$62

Mass Annual Laboratory Operating Cost

Laboratory Support Cost Mass Analyses		Year 1	Year 2	Year 3	3 YearTotal
-- Balance calibrations	\$100	\$100	\$0	\$0	
-- Consumables for the balance room	\$500	\$500	\$0	\$0	
-- LIMS service contract (Fixed cost)	\$1	\$1	\$1	\$1	
-- LIMS/LAN support services (Fixed Cost)	\$25	\$25	\$25	\$25	
New filter samples support cost		\$27	\$26	\$26	
Total support cost per year		\$27	\$27	\$27	\$81

Analyses Cost

Materials, shipping (not including filter)	\$7.00				
-- Daily sampling	100%	\$7	\$2	\$0	
-- 1-in-3 sampling	100%	\$4	\$0	\$0	
-- 1-in-6 sampling	100%	\$0	\$0	\$0	
-- Collocated sampling	100%	\$980	\$427	\$0	
New samples material cost		\$13	\$2	\$0	
Total materials cost		\$13	\$43	\$43	\$100
Staff cost (inspection, weighing, data submittal)	\$42.50				
-- Daily sampling		\$45	\$15	\$0	
-- 1-in-3 sampling		\$28	\$0	\$0	
-- 1-in-6 sampling		\$0	\$0	\$0	
-- Collocated sampling		\$5	\$2	\$0	
New samples staff cost		\$80	\$18	\$0	
Total staff cost		\$80	\$264	\$264	\$610
Operating Cost for New Samples		\$121	\$47	\$26	
Operating Cost for All Samples		\$121	\$335	\$335	\$791
Operating Cost per MASS analysis					\$55

ELEMENTS BY X-RAY FLUORESCENCE

One Time Laboratory Start Up Cost		Year 1	Year 2	Year 3	3 YearTotal
-- Furniture	\$3	\$0			
-- XRF Spectrometer	\$161	\$0	\$0	\$0	
-- Microscope	\$1	\$0			
-- Computer/Printer	\$2	\$0	\$0	\$0	
-- Data Handling system (LIMS/LAN)	\$8	\$0			
Total Capital Start up Cost		\$0	\$0	\$0	\$0

Elements Annual Laboratory Operating Cost

Laboratory Support Cost X-Ray Fluorescence		Year 1	Year 2	Year 3	3 YearTotal
-- Service Contract for Spectrometer	\$8	\$0	\$0	\$0	
-- LIMS service contract (Fixed cost)	\$850	\$0	\$0	\$0	
-- LIMS/LAN support services (Fixed Cost)	\$10	\$0	\$0	\$0	
New filter samples support cost		\$0	\$0	\$0	
Total support cost per year		\$0	\$0	\$0	\$0

Analyses Cost

Materials, shipping (not including filter)	\$0.70				
-- Daily sampling	0%	\$0	\$0	\$0	
-- 1-in-3 sampling	0%	\$0	\$0	\$0	
-- 1-in-6 sampling	0%	\$0	\$0	\$0	
-- Collocated sampling	0%	\$0	\$0	\$0	
New samples material cost		\$0	\$0	\$0	
Total materials cost		\$0	\$0	\$0	\$0
Staff cost (inspection, weighing, data submittal)	\$26.00				
-- Daily sampling		\$0	\$0	\$0	
-- 1-in-3 sampling		\$0	\$0	\$0	
-- 1-in-6 sampling		\$0	\$0	\$0	
-- Collocated sampling		\$0	\$0	\$0	
New samples staff cost		\$0	\$0	\$0	
Total staff cost		\$0	\$0	\$0	\$0
Annual Operating Cost for New Samples		\$0	\$0	\$0	
Annual Operating Cost for All Samples		\$0	\$0	\$0	\$0
Operating cost per ELEMENTAL analysis					NA

::

IONS BY ION CHROMATOGRAPHY

One Time Laboratory Start Up Cost		Year 1	Year 2	Year 3	3 YearTotal
-- Furniture	\$13	\$0			
-- Ion Chromatograph	\$70	\$0	\$0	\$0	
-- NanoPure Water System	\$2	\$0			
-- Sonicator/Bath (for extractions)	\$1	\$0			
-- Shaker (for extractions)	\$3	\$0			
-- Barcode Reader	\$800	\$0			
-- Refrigerator	\$5	\$0			
-- Freezer	\$5	\$0			
-- Computer/Printer	\$2	\$0	\$0	\$0	
-- Data Handling system (LIMS/LAN)	\$8	\$0			
Total Capital Start up Costs		\$0	\$0	\$0	\$0

Ion Annual Laboratory Operating Cost

Laboratory Support Cost Ion Chromatography		Year 1	Year 2	Year 3	3 YearTotal
-- Service Contract for Spectrometer	\$9	\$0	\$0	\$0	
-- LIMS service contract (Fixed cost)	\$430	\$0	\$0	\$0	
-- LIMS/LAN support services (Fixed Cost)	\$10	\$0	\$0	\$0	
New filter samples support cost		\$0	\$0	\$0	
Total support cost per year		\$0	\$0	\$0	\$0

Analyses Cost

Materials, shipping (not including filter)	\$5.15				
-- Daily sampling	0%	\$0	\$0	\$0	
-- 1-in-3 sampling	0%	\$0	\$0	\$0	
-- 1-in-6 sampling	0%	\$0	\$0	\$0	
-- Collocated sampling	0%	\$0	\$0	\$0	
New samples material cost		\$0	\$0	\$0	
Total materials cost		\$0	\$0	\$0	\$0
Staff cost (inspection, weighing, data submittal)	\$42.50				
-- Daily sampling		\$0	\$0	\$0	
-- 1-in-3 sampling		\$0	\$0	\$0	
-- 1-in-6 sampling		\$0	\$0	\$0	
-- Collocated sampling		\$0	\$0	\$0	
New samples staff cost		\$0	\$0	\$0	
Total staff cost		\$0	\$0	\$0	\$0
Annual Operating Cost for New Samples		\$0	\$0	\$0	
Annual Operating Cost for All Samples		\$0	\$0	\$0	\$0
Operating cost per ION analysis					NA

Analyses cost per FRM/FEM filter	\$55
Average annual analyses cost per FRM/FEM sampler	\$9

START UP & ANNUAL LABORATORY COST of FILTER MEDIA COLLECTED on SPECIATION SAMPLER

Purple Values are input on AdjustableCosts Page

Agency Name

Blue Values are input on NetworkDesign Page

Estimate version

MASS

One Time Laboratory Start up Cost		Year 1	Year 2	Year 3	3 YearTotal
-- Furniture	\$13	\$0	\$0	\$0	
-- Environmental control system	\$10	\$0	\$0	\$0	
-- Microbalance	\$9	\$0	\$0	\$0	
-- Balance table	\$515	\$0	\$0	\$0	
-- Temperature/Humidity recorder	\$600	\$0	\$0	\$0	
-- Calibration materials	\$500	\$0	\$0	\$0	
-- Computer/Printer	\$2	\$0	\$0	\$0	
-- Large capacity refrigerator	\$5	\$0	\$0	\$0	
-- Barcode reader	\$800	\$0	\$0	\$0	
-- Data handling system (LIMS/LAN)	\$20	\$0	\$0	\$0	
Total capital start up cost		\$0	\$0	\$0	\$0

ANNUAL LABORATORY OPERATING COST

Laboratory Support Cost Mass Analyses		Year 1	Year 2	Year 3	3 YearTotal
-- Balance calibrations	\$100	\$0	\$0	\$0	
-- Consumables for the balance room	\$500	\$0	\$0	\$0	
-- LIMS service contract (Fixed cost)	\$1	\$0	\$0	\$0	
-- LIMS/LAN support services (Fixed Cost)	\$25	\$0	\$0	\$0	
New filter samples support cost		\$0	\$0	\$0	
Total support cost per year		\$0	\$0	\$0	\$0

Analyses Cost

Materials, shipping (not including filter)	\$7.00				
-- 1-in-6 sampling	0%	\$0	\$0	\$0	
-- 1-in-12 sampling	0%	\$0	\$0	\$0	
-- User Defined sampling	0%	\$0	\$0	\$0	
New samples material cost		\$0	\$0	\$0	
Total materials cost		\$0	\$0	\$0	\$0
Staff cost (inspection, weighing, data submittal)	\$42.50				
-- 1-in-6 sampling		\$0	\$0	\$0	
-- 1-in-12 sampling		\$0	\$0	\$0	
-- User Defined sampling		\$0	\$0	\$0	
New samples staff cost		\$0	\$0	\$0	
Total staff cost		\$0	\$0	\$0	\$0
Annual Operating Cost for New Samples		\$0	\$0	\$0	
Annual Operating Cost for All Samples		\$0	\$0	\$0	\$0
Operating Cost per Sample (Mass)					NA

ELEMENTS BY X-RAY FLUORESCENCE

One Time Laboratory Start up Cost		Year 1	Year 2	Year 3	3 YearTotal
-- Furniture	\$3	\$0	\$0	\$0	
-- XRF Spectrometer	\$161	\$0	\$0	\$0	
-- Microscope	\$1	\$0	\$0	\$0	
-- Computer/Printer	\$2	\$0	\$0	\$0	
-- Data handling system (LIMS/LAN)	\$8	\$0	\$0	\$0	
Total capital start up cost		\$0	\$0	\$0	\$0

ANNUAL LABORATORY OPERATING COST

Laboratory Support Cost X-Ray Fluorescence		Year 1	Year 2	Year 3	3 YearTotal
-- Service contract for Spectrometer	\$8	\$0	\$0	\$0	
-- LIMS service contract (Fixed cost)	\$850	\$0	\$0	\$0	
-- LIMS/LAN support services (Fixed Cost)	\$10	\$0	\$0	\$0	
New filter samples support cost		\$0	\$0	\$0	
Total support cost per year		\$0	\$0	\$0	\$0

Analyses Cost

Materials, shipping (not including filter)	\$0.70				
-- 1-in-6 sampling	100%	\$0	\$0	\$0	
-- 1-in-12 sampling	100%	\$0	\$0	\$0	
-- User Defined sampling	100%	\$0	\$0	\$0	
New samples material cost		\$0	\$0	\$0	
Total materials cost		\$0	\$0	\$0	\$0
Staff cost (inspection, weighing, data submittal)	\$26.00				
-- 1-in-6 sampling		\$0	\$0	\$0	
-- 1-in-12 sampling		\$0	\$0	\$0	
-- User Defined sampling		\$0	\$0	\$0	
New samples staff cost		\$0	\$0	\$0	
Total staff cost		\$0	\$0	\$0	\$0
Annual Operating Cost for New Samples		\$0	\$0	\$0	
Annual Operating Cost for All Samples		\$0	\$0	\$0	\$0
Operating Cost per Sample (Elements)					NA

IONS BY ION CHROMATOGRAPHY

ONE TIME LABORATORY START UP COST		Year 1	Year 2	Year 3	3 YearTotal
-- Furniture	\$13	\$0	\$0	\$0	
-- Ion Chromatograph	\$70	\$0	\$0	\$0	
-- NanoPure Water System	\$2	\$0	\$0	\$0	
-- Sonicator/Bath (for extractions)	\$1	\$0	\$0	\$0	
-- Shaker (for extractions)	\$3	\$0	\$0	\$0	
-- Barcode Reader	\$800	\$0	\$0	\$0	
-- Refrigerator	\$5	\$0	\$0	\$0	
-- Freezer	\$5	\$0	\$0	\$0	
-- Computer/Printer	\$2	\$0	\$0	\$0	
-- Data handling system (LIMS/LAN)	\$8	\$0	\$0	\$0	
Total capital start up cost		\$0	\$0	\$0	\$0

ANNUAL LABORATORY OPERATING COST

Laboratory Support Cost Ion Chromatography		Year 1	Year 2	Year 3	3 YearTotal
-- Service Contract for Spectrometer	\$9	\$0	\$0	\$0	
-- LIMS service contract (Fixed cost)	\$430	\$0	\$0	\$0	
-- LIMS/LAN support services (Fixed Cost)	\$10	\$0	\$0	\$0	
New filter samples support cost		\$0	\$0	\$0	
Total support cost per year		\$0	\$0	\$0	\$0

Analyses Cost

Materials, shipping (not including filter)	\$5.15				
-- 1-in-6 sampling	100%	\$0	\$0	\$0	
-- 1-in-12 sampling	100%	\$0	\$0	\$0	
-- User Defined sampling	100%	\$0	\$0	\$0	
New samples material cost		\$0	\$0	\$0	
Total materials cost		\$0	\$0	\$0	\$0
Staff cost (inspection, weighing, data submittal)	\$42.50				
-- 1-in-6 sampling		\$0	\$0	\$0	
-- 1-in-12 sampling		\$0	\$0	\$0	
-- User Defined sampling		\$0	\$0	\$0	
New samples staff cost		\$0	\$0	\$0	
Total staff cost		\$0	\$0	\$0	\$0
Annual Operating Cost for New Samples		\$0	\$0	\$0	
Annual Operating Cost for All Samples		\$0	\$0	\$0	\$0
Cost per Sample (Ion Chromatography)					NA

TOTAL CARBON

ONE TIME LABORATORY START UP COST		Year 1	Year 2	Year 3	3 YearTotal
-- Furniture	\$3	\$0	\$0	\$0	
-- Carbon Analyzer	\$26	\$0	\$0	\$0	
-- Barcode Reader	\$800	\$0	\$0	\$0	
-- Computer/Printer	\$2	\$0	\$0	\$0	
-- Data handling system (LIMS/LAN)	\$4	\$0	\$0	\$0	
Total capital start up cost		\$0	\$0	\$0	\$0

ANNUAL LABORATORY OPERATING COST**Laboratory Support Cost Total Carbon**

		Year 1	Year 2	Year 3	3 YearTotal
-- Service Contract for Carbon Analyzer	\$0	\$0	\$0	\$0	
-- LIMS service contract (Fixed cost)	\$200	\$0	\$0	\$0	
-- LIMS/LAN support services (Fixed Cost)	\$5	\$0	\$0	\$0	
New filter samples support cost		\$0	\$0	\$0	
Total support cost per year		\$0	\$0	\$0	\$0

Analyses Cost**Materials, shipping (not including filter)**

	\$2.50				
-- 1-in-6 sampling	100%	\$0	\$0	\$0	
-- 1-in-12 sampling	100%	\$0	\$0	\$0	
-- User Defined sampling	100%	\$0	\$0	\$0	
New samples material cost		\$0	\$0	\$0	
Total materials cost		\$0	\$0	\$0	\$0

Staff cost (inspection, weighing, data submittal)

	\$31.88				
-- 1-in-6 sampling		\$0	\$0	\$0	
-- 1-in-12 sampling		\$0	\$0	\$0	
-- User Defined sampling		\$0	\$0	\$0	
New samples staff cost		\$0	\$0	\$0	
Total staff cost		\$0	\$0	\$0	\$0

Annual Operating Cost for New Samples

\$0 \$0 \$0

Annual Operating Cost for All Samples

\$0 \$0 \$0 \$0

Cost per Sample (Carbon)

NA

AUTOMATED COLORIMETER (Nitrate Ion)**ONE TIME LABORATORY START UP COST**

		Year 1	Year 2	Year 3	3 YearTotal
-- Furniture	\$3	\$0	\$0	\$0	
-- Automated Colorimeter	\$30	\$0	\$0	\$0	
-- Barcode Reader	\$800	\$0	\$0	\$0	
-- Computer/Printer	\$2	\$0	\$0	\$0	
-- Data handling system (LIMS/LAN)	\$0	\$0	\$0	\$0	
Total capital start up cost		\$0	\$0	\$0	\$0

ANNUAL LABORATORY OPERATING COST**Laboratory Support Cost Colorimeter**

		Year 1	Year 2	Year 3	3 YearTotal
-- Service Contract for Colorimeter	\$2	\$0	\$0	\$0	
-- LIMS service contract (Fixed cost)	\$850	\$0	\$0	\$0	
-- LIMS/LAN support services (Fixed Cost)	\$15	\$0	\$0	\$0	
New filter samples support cost		\$0	\$0	\$0	
Total support cost per year		\$0	\$0	\$0	\$0

Analyses Cost**Materials, shipping (not including filter)**

	\$2.50				
-- 1-in-6 sampling	100%	\$0	\$0	\$0	
-- 1-in-12 sampling	100%	\$0	\$0	\$0	
-- User Defined sampling	100%	\$0	\$0	\$0	
New samples material cost		\$0	\$0	\$0	
Total materials cost		\$0	\$0	\$0	\$0

Staff cost (inspection, weighing, data submittal)

	\$8.50				
-- 1-in-6 sampling		\$0	\$0	\$0	
-- 1-in-12 sampling		\$0	\$0	\$0	
-- User Defined sampling		\$0	\$0	\$0	
New samples staff cost		\$0	\$0	\$0	
Total staff cost		\$0	\$0	\$0	\$0

Annual Operating Cost for New Samples

\$0 \$0 \$0

Annual Operating Cost for All Samples

\$0 \$0 \$0 \$0

Cost per Sample (Nitrate Ion)

NA

Analyses Cost per Speciation Filter Set

NA

Average Annual Analyses Cost per Speciation Sampler

NA

PM2.5: Field Estimates

Agency Name

Blue Values are input on Network Design Page

Estimate version

FRM/FEM Samplers		Year1	Year2	Year3	3 Year Total
-- Sampler cost (\$) - Sequential (daily, 1-in-3))	\$11	\$286	\$11	\$0	\$297
-- Sampler cost (\$) - Single (1-in-6)	\$8	\$0	\$0	\$0	\$0
-- Sampler cost (\$) - Collocated Sequential	\$11	\$77	\$11	\$0	\$88
-- Sampler cost (\$) - Collocated Single	\$8	\$0	\$0	\$0	\$0
Capital cost for new FRM/FEM samplers		\$363	\$22	\$0	\$385

One Time FRM/FEM Support Costs					
-- Set up, new site or sites req major modifications(\$)	\$3	\$18	\$3	\$0	
-- Set up, existing site (\$)	\$250	\$6	\$250	\$0	
-- Calibration equipment flow	\$1	\$6	\$0	\$0	
-- Calibration equipment pressure, temperature	\$1	\$4	\$0	\$0	
-- Flow audit devices	\$1	\$6	\$0	\$0	
-- Pressure, temperature audit devices	\$0	\$0	\$0	\$0	
-- Spare parts - Sequential	\$1	\$36	\$2	\$0	
-- Spare parts - Single	\$800	\$0	\$0	\$0	
Capital cost for FRM/FEM support equipment		\$78	\$5	\$0	\$83

Continuous Samplers					
-- Sampler cost (\$) - Continuous	\$17	\$0	\$0	\$0	
Capital cost for new Continuous samplers		\$0	\$0	\$0	\$0

One Time Continuous Sampler Support Costs					
-- Set up, new site or sites req major modifications(\$)	\$3	\$0	\$0	\$0	
-- Set up, existing site (\$)	\$250	\$0	\$0	\$0	
-- Flow calibration equipment	\$2	\$0	\$0	\$0	
-- Other calibration equipment	\$0	\$0	\$0	\$0	
-- Flow audit devices	\$2	\$0	\$0	\$0	
-- Other audit devices	\$0	\$0	\$0	\$0	
-- Spare parts - Continuous	\$1	\$0	\$0	\$0	
Capital cost for Continuous sampler support equipment		\$0	\$0	\$0	\$0

Speciation Samplers					
-- Sampler cost (\$) - Speciation	\$26	\$0	\$0	\$0	\$0
Capital cost for new Speciation samplers		\$0	\$0	\$0	\$0

One Time Speciation Sampler Support Costs					
-- Set up, new site or sites req major modifications(\$)	\$3	\$0	\$0	\$0	
-- Set up, existing site (\$)	\$250	\$0	\$0	\$0	
-- Flow calibration equipment	\$6	\$0	\$0	\$0	
-- Other calibration equipment	\$0	\$0	\$0	\$0	
-- Flow audit devices	\$6	\$0	\$0	\$0	
-- Other audit devices	\$0	\$0	\$0	\$0	
-- Spare parts - Speciation	\$2	\$0	\$0	\$0	
Capital cost for Speciation sampler support equipment		\$0	\$0	\$0	\$0

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OPERATING					
FRM/FEM Sampler		Year1	Year2	Year3	3 Year Total
-- Electrical \$ for new FRM/FEM samplers	\$0.43	\$821	\$184	\$0	
-- Field Staff cost per filter (including WINS)	\$22	\$42	\$9	\$0	
-- Shipping cost per filter	\$5	\$9	\$2	\$0	
-- Field staff cost for other FRM/FEM servicing	\$11	\$20	\$4	\$0	
-- Field staff cost for flow calibration(s)	\$80	\$870	\$161	\$0	
-- Field staff cost for temperature/pressure calibration	\$80	\$870	\$161	\$0	
-- Audit staff cost for flow audits	\$483	\$5	\$966	\$0	
-- Audit staff cost for other audits	\$121	\$1	\$241	\$0	
Operating cost for new FRM/FEM samplers		\$81	\$17	\$0	
Annual operating cost for all FRM/FEM samplers		\$81	\$265	\$265	\$611

Continuous Samplers					
-- Electrical \$ for new continuous samplers	\$1.65	\$0	\$0	\$0	
-- Field staff cost maintenance	\$979	\$0	\$0	\$0	
-- Field staff cost for flow calibration(s)	\$161	\$0	\$0	\$0	
-- Field staff cost for other calibration(s)	\$80	\$0	\$0	\$0	
-- Audit staff cost for flow audits	\$40	\$0	\$0	\$0	
-- Audit staff cost for other audits	\$0	\$0	\$0	\$0	
Operating cost for new Continuous samplers		\$0	\$0	\$0	
Annual operating cost for all Continuous samplers		\$0	\$0	\$0	\$0

Speciation Samplers					
-- Electrical \$ for new speciation	\$1.65	\$0	\$0	\$0	
-- Field staff cost per filter set	\$80	\$0	\$0	\$0	
-- Shipping cost per filter set	\$5	\$0	\$0	\$0	
-- Field staff cost for flow calibration(s)	\$241	\$0	\$0	\$0	
-- Field staff cost for other maintenance(s)	\$121	\$0	\$0	\$0	
-- Audit staff cost for flow audits	\$40	\$0	\$0	\$0	
-- Audit staff cost for other audits	\$0	\$0	\$0	\$0	
Operating cost for new Speciation samplers		\$0	\$0	\$0	
Annual operating cost for all Speciation samplers		\$0	\$0	\$0	\$0

Field Summary	Year1	Year2	Year3	3 Year Total
New Samplers Cost	\$363	\$22	\$0	\$385
Capital cost for sampler support equipment	\$78	\$5	\$0	\$83
Annual Operating Cost for All Samplers	\$81	\$265	\$265	\$611
Total Network Field Costs	\$522	\$292	\$265 >>	\$1

Operational Cost per FRM/FEM Filter Sample				\$43
Full Year FRM/FEM Sampler Operating Cost				\$7
Actual FRM/FEM Operating Cost	\$2	\$7	\$7	
Full Year Average Continuous Sampler Operating Cost				Not deployed
Operational Cost per Speciation Sampler Filter Set				Not deployed
Full Year Average Speciation Sampler Operating Cost				Not deployed

SUMMARY of PM2.5 NETWORK SETUP and OPERATING

Agency Name

Blue Values are input on NetworkDesign Page

Estimate version

NETWORK DESIGN

Number of FRM/FEM Samplers	Year1	Year2	Year3	3 Year Total
New samplers on daily schedule	9	1	0	10
New samplers on 1-in-3 day schedule	17	0	0	17
New samplers on 1-in-6 day schedule	0	0	0	0
Collocated samplers	7	1	0	8
New FRM/FEM samplers per year	33	2	0	
Total number of samplers	33	35	0	35
Number of FRM/FEM Filter Samples				
New FRM/FEM filters samples per year	1900	426	0	
Total number of FRM/FEM filter samples per year	1900	6228	6228	14356

Total number of FRM/FEM sites	26	27	27	27
Number of available operating days	120	365	365	

Number of Continuous Samplers

New continuous samplers per year	0	0	0	
Total number of continuous samplers	0	0	0	0

Number of Speciation Samplers

New 1-in-6 samplers per year	0	0	0	0
New 1-in-12 samplers per year	0	0	0	0
New user defined samplers per year	0	0	0	0
New speciation samplers per year	0	0	0	
Total number of speciation samplers	0	0	0	0

Number of Speciation Filter Samples

New speciation filter samples per year	0	0	0	
Total number of speciation sample sets per year	0	0	0	0

FIELD COST ESTIMATES

FRM/FEM Samplers	Year1	Year2	Year3	3 Year Total
Capital cost for new FRM/FEM samplers	\$363	\$22	\$0	\$385
Capital cost for FRM/FEM support equipment	\$78	\$5	\$0	\$83
Operating cost for all FRM/FEM samplers	\$81	\$265	\$265	\$611
Total FRM/FEM samplers cost	\$522	\$292	\$265	\$1

Continuous Samplers

Capital cost for new Continuous samplers	\$0	\$0	\$0	\$0
Capital cost for Continuous sampler support equipment	\$0	\$0	\$0	\$0
Operating cost for all continuous samplers	\$0	\$0	\$0	\$0
Total continuous samplers cost	\$0	\$0	\$0	\$0

Speciation Samplers

Capital cost for new Speciation samplers	\$0	\$0	\$0	\$0
Capital cost for Speciation support equipment	\$0	\$0	\$0	\$0
Operating cost for all speciation samplers	\$0	\$0	\$0	\$0
Total speciation samplers cost	\$0	\$0	\$0	\$0

SUMMARY FIELD EXPENDITURE

Capital cost for all samplers	\$363	\$22	\$0	\$385
Capital cost for sampler support equipment	\$78	\$5	\$0	\$83
Annual operating cost of all samplers	\$81	\$265	\$265	\$611
Total Field Cost	\$522	\$292	\$265	\$1

Operational Cost per FRM/FEM Filter Sample				\$43
Full Year FRM/FEM Sampler Operating Cost				\$7
Full Year Average Continuous Sampler Operating Cost				Not deployed
Full Year Average Speciation Sampler Operating Cost				Not deployed

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LABORATORY ESTIMATES**FRM/FEM SAMPLER**

	Year1	Year2	Year3	3 Year Total
Mass Analyses				
Capital cost	\$62	\$0	\$0	
Laboratory support cost	\$27	\$27	\$27	
Analyses cost	\$94	\$308	\$308	
Total FRM/FEM Mass analyses cost	\$183	\$335	\$335	\$854

Elements By X-Ray

Capital cost	\$0	\$0	\$0	
Laboratory support cost	\$0	\$0	\$0	
Analyses cost	\$0	\$0	\$0	
Total FRM/FEM Elements analyses cost	\$0	\$0	\$0	\$0

Anions and Cations by Ion Chromatography

Capital cost	\$0	\$0	\$0	
Laboratory support cost	\$0	\$0	\$0	
Analyses cost	\$0	\$0	\$0	
Total FRM/FEM Ion analyses cost	\$0	\$0	\$0	\$0

SUMMARY LABORATORY FRM/FEM EXPENDITURES

Capital cost	\$62	\$0	\$0	
Laboratory support cost	\$27	\$27	\$27	
Analyses cost	\$94	\$308	\$308	
Total FRM/FEM analyses cost	\$183	\$335	\$335	\$854

Analyses cost per FRM/FEM filter				\$55
Average annual analyses cost per FRM/FEM sampler				\$9

SPECIATION SAMPLER**Mass Analyses Speciation Sampler**

Capital cost	\$0	\$0	\$0	
Laboratory support cost	\$0	\$0	\$0	
Analyses cost	\$0	\$0	\$0	
Total speciation sampler Mass analyses cost	\$0	\$0	\$0	\$0

Elements By X-Ray Speciation Sampler

Capital cost	\$0	\$0	\$0	
Laboratory support cost	\$0	\$0	\$0	
Analyses cost	\$0	\$0	\$0	
Total speciation sampler Elements analyses cost	\$0	\$0	\$0	\$0

Nitrate Ion by Chromatography

Capital cost	\$0	\$0	\$0	
Laboratory support cost	\$0	\$0	\$0	
Analyses cost	\$0	\$0	\$0	
Total speciation sampler Ion analyses cost	\$0	\$0	\$0	\$0

Total Carbon				
Capital cost	\$0	\$0	\$0	
Laboratory support cost	\$0	\$0	\$0	
Analyses cost	\$0	\$0	\$0	
Total speciation sampler Carbon analyses cost	\$0	\$0	\$0	\$0

Nitrate Ion by Colorimetry				
Capital cost	\$0	\$0	\$0	
Laboratory support cost	\$0	\$0	\$0	
Analyses cost	\$0	\$0	\$0	
Total speciation sampler Ion analyses cost	\$0	\$0	\$0	\$0

SUMMARY LABORATORY SPECIATION EXPENDITURES				
Capital cost	\$0	\$0	\$0	
Laboratory support cost	\$0	\$0	\$0	
Analyses cost	\$0	\$0	\$0	
Total speciation sampler analyses cost	\$0	\$0	\$0	\$0

Analyses Cost per Speciation Filter Set	NA
Average Annual Analyses Cost per Speciation Sampler	NA

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SUMMARY LABORATORY FRM/FEM & SPECIATION SAMPLERS				
Capital cost	\$62	\$0	\$0	
Laboratory support cost	\$27	\$27	\$27	
Analyses cost	\$94	\$308	\$308	
Total laboratory cost	\$183	\$335	\$335	\$854

SUMMARY PM2.5 CAPITAL AND OPERATING COSTS				
Ambient Samplers and Laboratory Equipment Costs	\$425	\$22	\$0	
Field and Laboratory Support Costs	\$105	\$32	\$27	
Operation and Analyses Costs	\$175	\$573	\$573	
Total program cost	\$706	\$628	\$600	\$1